

Actions to enhance research, development and deployment of AI applications

The 5G-LOGINNOV and 5GMETA projects have identified a number of roadblocks and gaps during the deployment of their envisioned innovations. These gaps can prevent the early deployment, scalability, and further efficiency of AI applications. Several recommendations have been developed to tackle the roadblocks identified; some of those recommendations, relevant for both projects, have been formulated as a call to action and presented in this document.

The **5G-LOGINNOV** project's vision is to optimise freight and traffic operations at ports and logistics hubs by using new innovative concepts, applications and devices supported by 5G technologies, Internet of Things (IoT), data analytics, next generation traffic management, Cooperative, Connected and Automated Mobility (CCAM) and the 5G logistics corridor. These operations will ensure port areas and city-ports can handle upcoming and future capacity, cope with traffic congestion, environmental challenges while developing economic and innovative business opportunities for the region.

The **5GMETA** open platform aims to leverage car-captured data to stimulate, facilitate and feed innovative products and services. Cars capture and generate huge volumes of real-time data. With connected and automated mobility applications expanding at fast pace, the value of data from vehicles is vital not only for the automotive industry, but also for new players such as SMEs and high-tech start-ups. By expanding 5G network functions, 5GMETA will stimulate and facilitate innovative products and services whilst ensuring data privacy, security, interoperability, and ownership.

A Comprehensive Framework for Advancing AI Applications

In response to the identified gaps hindering the optimal deployment of AI applications in logistics and port operations within the 5G-LOGINNOV project, and in an open data-centric Internet of Things (IoT) messaging platform for the 5GMETA project, a strategic policy framework titled "Enhance research, development and deployment of AI applications" is proposed. This policy framework encompasses diverse dimensions crucial for fostering innovation and addressing challenges in the field. Below is a list of comprehensive actions developed under this framework.

1. Investment in Research and Development (R&D)

It is crucial to continue allocating government funding and incentives for AI tools and software development projects. By encouraging public-private partnerships and collaborations with academic institutions cutting-edge developments in AI tools and software can be fostered.

2. Stimulate Open-Source Initiatives

To drive innovation and collaboration in the dynamic domain of artificial intelligence (AI), the active promotion and financial backing of open-source initiatives stand as imperative pillars. This entails not merely an endorsement but a robust commitment to supporting diverse open-source AI projects, cultivating fertile ground for organizations and developers to contribute to the collective knowledge and progression of AI technologies. A central facet of this endeavor involves the establishment of a dedicated platform that serves as a focal point for hosting and showcasing open-source AI tools and software. This centralized hub aims to catalyze collaboration, streamline knowledge-sharing, and amplify the impact of these initiatives by aggregating resources and projects in an accessible space.

3. Establishment of Ethical Guidelines

The establishment of clear and comprehensive ethical guidelines for the development and deployment of AI systems is imperative. These guidelines serve as a foundational framework to ensure that AI applications are crafted and employed responsibly, adhering to ethical standards aligned with societal values. This robust ethical

framework needs to be meticulously designed to address diverse considerations such as privacy concerns, bias, transparency issues in decision-making processes, etc. It is crucial for these guidelines to remain adaptive, evolving in tandem with technological advancements and emerging ethical challenges.

4. Data Sharing

In connection with the two previous actions, it is very important to promote data sharing practices while respecting privacy and security considerations. Open access to diverse and comprehensive datasets can be invaluable for AI research and development. The accessibility to a rich tapestry of datasets not only fuels innovation but also augments the robustness of AI algorithms, enabling them to navigate intricate challenges and nuances inherent in real-world scenarios. Furthermore, these datasets should be described using common and extensible data formats as described in¹.

5. Focus on Standards and Interoperability

This entails the proactive development of universally recognized standards governing AI tools and software, a measure aimed at ensuring seamless compatibility and interoperability across diverse platforms. The creation of a structured framework for AI technologies not only enhances their integration potential but also facilitates a more streamlined and efficient ecosystem. To fortify the adoption of these standards, it is crucial to incentivize and motivate the industry to adhere to such protocols. This could be achieved through a system of certifications or other incentivization mechanisms that recognize and reward compliance with industry standards.

6. Addressing Regulatory and Administrative Challenges: Collaborative Solutions

To tackle regulatory gaps hindering AI installations, collaboration with legislative bodies is crucial. It is vital to work with stakeholders to develop efficient approval processes and transparent guidelines for AI technologies, aligning these guidelines with evolving legal frameworks. Administrative hurdles, such as managing consent forms and integrating development activities into regular operations, call for comprehensive guidance and planning. In addition, the establishment of an inventory of required administrative documents and the alignment with stakeholders during the planning phase are essential for seamless integration and adherence to regulatory requirements.

7. Empowering Training and Building Capacity: Tailored Solutions for Early Adoption

To combat the lack of experience among early adopters, especially concerning technical installations, tailored training programs need to be fostered. These programs should cater to the specific needs of early adopters and technical staff, covering AI technology fundamentals, installation procedures, and operational knowledge. Additionally, ensuring easy access to various training resources, including online courses, expert-led sessions, and comprehensive documentation, is vital to support continuous learning and skill development. Furthermore, there is a need to increase capacity-building programs to upskill existing personnel in AI and data sharing, facilitating ongoing learning and development.

8. Mitigating Cost and Business Model Challenges: Fostering Transparency and Innovation

Addressing difficulties in calculating full costs and maintaining transparency in cost estimation is challenging. Additionally, overcoming resistance to investment and aligning societal benefits with private objectives requires cultivating an innovation-driven mindset. To tackle this challenge, clear documentation of cost components and budget allocations enhances the understanding of the stakeholders. In addition, emphasizing Return on Investment (ROI), and encouraging risk-taking, experimentation, and a collaborative culture to foster cross-functional collaboration and co-creation of business strategies, ultimately promotes a conducive environment for successful innovation.

¹ Djibrilla Amadou Kountche, Mandimby Ranaivo Rakotondravelona, Pavlos Basaras, Ralf Willenbrock, Janez Sterle, Rudolf Susnik (2023) *5G and Logistics Data Collection: the 5G-LOGINNOV Approach*. TRA Lisbon. Available at: https://5g-loginnov.eu/wp-content/uploads/2023/06/5G-and-logistics-data-collection-the-5G-LOGINNOV-approach_TRA-Lisbon-2022_v1_0.pdf (Accessed: 06 December 2023).

CONCLUSIONS

In conclusion, the proposed strategic policy framework, "Enhance Research, Development, and Deployment of AI Applications," stands as a comprehensive and forward-thinking outline to the identified gaps impeding the optimal deployment of AI. This framework encompasses a series of targeted actions designed to foster innovation and tackle challenges at various levels.

The first pillar of the framework focuses on sustaining progress through **continued investment in Research and Development**. By encouraging ongoing government funding and fostering public-private collaborations, this approach ensures a continuous influx of resources for cutting-edge developments in AI tools and software. Additionally, the framework advocates for the active **support of open-source initiatives**. By stimulating collaborative projects, the proposal aims to create a dynamic environment that promotes innovation and facilitates the sharing of knowledge, ultimately contributing to advancements in AI technologies. **Ethical considerations** are at the core of the proposed framework, with the establishment of clear and adaptive ethical guidelines. This ensures that AI development and deployment align with societal values, promoting responsible practices and addressing concerns related to the ethical implications of AI applications. Furthermore, the emphasis on **data sharing** practices plays a pivotal role in enriching AI algorithms. By promoting responsible data sharing, the framework facilitates the availability of valuable datasets for research and development, contributing to the refinement of AI applications. **Universal standards and interoperability** are addressed to enhance the integration potential of AI across platforms. The development of universally recognized standards ensures seamless compatibility and promotes a cohesive ecosystem for AI technologies in logistics and port operations. **Collaborative solutions** with legislative bodies are proposed to address regulatory and administrative challenges. Streamlining approval processes and providing transparent guidelines for AI technologies contribute to a regulatory environment that fosters innovation while ensuring compliance. To address the human factor, the framework focuses on empowering **training and building capacity**. Tailored training programs for early adopters and technical staff, along with increased capacity-building initiatives, are proposed to bridge the gap in experience and promote ongoing skill development. Mitigating **cost and business model** challenges is another critical aspect of the framework. By fostering transparency in cost estimation and promoting an innovation-driven mindset, the proposal addresses difficulties in calculating full costs and aligns societal benefits with private objectives.

In essence, this strategic policy framework not only tackles immediate challenges but also establishes a proactive foundation for the future of AI applications. By addressing ethical considerations, regulatory compliance, and the continuous development of skills, this framework lays the groundwork for transformative advancements in the field, ensuring a sustainable and responsible integration of AI technologies.

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